

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: <b>Tapperson</b>	§	
	§	Group Art Unit: <b>2142</b>
Serial No. <b>09/844,340</b>	§	
	§	Examiner: <b>Meucci, Michael D.</b>
Filed: <b>April 27, 2001</b>	§	
	§	
For: <b>Mechanism to Cache References</b>	§	
<b>to Java RMI Remote Objects</b>	§	
<b>Implementing the Unreferenced</b>		
<b>Interface</b>		

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**35525**  
PATENT TRADEMARK OFFICE  
CUSTOMER NUMBER

**APPEAL BRIEF (37 C.F.R. 41.37)**

This brief is in furtherance of the Notice of Appeal, filed in this case on June 5, 2006.

A fee of \$500.00 is required for filing an Appeal Brief. Please charge this fee to IBM Corporation Deposit Account No. 09-0447. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to IBM Corporation Deposit Account No. 09-0447.

**REAL PARTY IN INTEREST**

The real party in interest in this appeal is the following party: International Business Machines Corporation of Armonk, N.Y.

### **RELATED APPEALS AND INTERFERENCES**

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

## **STATUS OF CLAIMS**

### **A. TOTAL NUMBER OF CLAIMS IN APPLICATION**

Claims in the application are: 1-40

### **B. STATUS OF ALL THE CLAIMS IN APPLICATION**

1. Claims canceled: 17 and 35
2. Claims withdrawn from consideration but not canceled: none
3. Claims pending: 1-16, 18-34 and 36-40
4. Claims allowed: none
5. Claims rejected: 1-16, 18-34 and 36-40
6. Claims objected to: none

### **C. CLAIMS ON APPEAL**

The claims on appeal are: 1-16, 18-34 and 36-40

### **STATUS OF AMENDMENTS**

No amendment after final was filed for this case.

## **SUMMARY OF CLAIMED SUBJECT MATTER**

### **A. CLAIM 1 - INDEPENDENT**

Remote method invocation (RMI) is a remote procedure call (RPC) that allows Java objects stored on a network to be run remotely. Creating an RMI connection is resource intensive, in that a client sends a request for an RMI connection to an RMI server, and the RMI server returns an RMI connection object. The RMI connection is then used to send and receive data. When the RMI client is done with the connection, the RMI server destroys the connection object. When a new connection is required, the above process is repeated in its entirety. Using this mechanism may be expensive from a time standpoint, because it requires a new connection to be established every time a client initiates a new transfer of data. A possible solution to this problem is to maintain the connection object even after its use has been completed. However, this technique may be expensive from a memory usage standpoint, because it never allows unused connections to be destroyed through normal resource utilization management.

The techniques of the present invention allow for *re-use of an RMI connection* that has previously been established. A 'normal' reference to an RMI connection object is maintained for a timer-dependent period of time after the connection has termination, in effect preventing the RMI connection object from being removed/deleted. After the timer expires, the reference to the RMI object is made 'weak', thus allowing it to be removed/discarded as part of normal resource utilization management. Specifically, Claim 1 is directed to a method, in a client, for managing connections to a server in a distributed environment. A connection to the server is established. A timer is started in response to conclusion of a communication process using the connection, and a normal reference to a connection object for the connection is maintained. Responsive to conclusion of a predetermined time period measured by the timer, a weak reference to the connection object is maintained. Connection objects maintained by the weak references are periodically destroyed (Specification page 12, line 9 – page 13, line 15; Figure 5, all elements).

### **B. CLAIM 13 - INDEPENDENT**

Claim 13 is directed to a method, in a client, for reusing a connection to a server. A weak reference to a connection object for a connection to a server is identified. A determination is made as to whether the connection object has been destroyed. If the connection object has not

been destroyed, the connection is reused (Specification page 12, line 24 – page 13, line 7; Figure 5, elements 503-507). Using this technique advantageously allows for caching the connection for a period of time, such that if the connection is needed during such period of time, the connection can be reused without requiring a new setup of a new connection object (Specification page 13, lines 8-15).

**C. CLAIM 20 - INDEPENDENT**

Claim 20 is an apparatus claim corresponding to method Claim 1, and the summary of Claim 1 is applicable for Claim 20, and thus is hereby incorporated by reference.

**D. CLAIM 31 - INDEPENDENT**

Claim 31 is an apparatus claim corresponding to method Claim 13, and the summary of Claim 13 is applicable for Claim 31, and thus is hereby incorporated by reference.

**E. CLAIM 38 - INDEPENDENT**

Claim 38 is a program product claim corresponding to method Claim 1, and the summary of Claim 1 is applicable for Claim 38, and thus is hereby incorporated by reference.

**F. CLAIM 39 - INDEPENDENT**

Claim 39 is a program product claim corresponding to method Claim 13, and the summary of Claim 13 is applicable for Claim 39, and thus is hereby incorporated by reference.

## **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

### **A. GROUND OF REJECTION 1 (Claims 1-5, 7, 9-14, 16, 20-24, 26-32, 34 and 38-39)**

Whether Claims 1-5, 7, 9-14, 16, 20-24, 26-32, 34 and 38-39 are obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) under 35 U.S.C. § 103(a).

### **B. GROUND OF REJECTION 2 (Claims 6, 15, 25 and 33)**

Whether Claims 6, 15, 25 and 33 are obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) and Official Notice under 35 U.S.C. § 103(a).

### **C. GROUND OF REJECTION 3 (Claim 8)**

Whether Claim 8 is obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) and Wollrath (U.S. 5,832,529) under 35 U.S.C. § 103(a).

### **D. GROUND OF REJECTION 4 (Claims 18, 36 and 40)**

Whether Claims 18, 36 and 40 are obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) and Geise et al. (U.S. 5,247,520) under 35 U.S.C. § 103(a).

### **E. GROUND OF REJECTION 5 (Claims 19 and 37)**

Whether Claims 19 and 37 are obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) and Geise et al. (U.S. 5,247,520) and Weinstein et al. (Google Groups comp.lang.java.databases) under 35 U.S.C. § 103(a).



## ARGUMENT

### **A. GROUND OF REJECTION 1 (Claims 1-5, 7, 9-14, 16, 20-24, 26-32, 34 and 38-39)**

The Examiner rejected Claims 1-5, 7, 9-14, 16, 20-24, 26-32, 34 and 38-39 as being obvious over Endicott et al. (U.S. 6,047,295) in view of Howes et al. (U.S. 6,366,558 B1) and de la Salle (U.S. 5,878,420) under 35 U.S.C. § 103(a).

#### **A.1. Claims 1, 8-12, 20, 27-30 and 38**

With respect to Claim 1, it is urged that none of the cited references teach or suggest the claimed feature of “responsive to conclusion of a predetermined time period measured by the timer, maintaining a weak reference to the connection object”. In rejecting Claim 1, the Examiner acknowledges that Endicott does not teach this claimed feature<sup>1</sup>. To account for this missing claimed feature, the Examiner alleges that Howes discloses “The timer field is used to time out a connection object when no activity occurs on the connection for a specified period of time (lines 10-12 of column 14)”. Appellants urge that this allegation does not establish a teaching or suggestion of the claimed step of *maintaining a weak reference to the connection object responsive to* conclusion of a predetermined time period measured by the timer. Rather, Howes connection object is “timed out” when no activity occurs for a specified period of time - which is substantially different from maintaining a weak reference to the connection object responsive to conclusion of a predetermined time period. Thus, the Examiner has failed to establish a prima facie showing of obviousness with respect to Claim 1<sup>2</sup>. Accordingly, the burden has not shifted to Applicant to rebut such improper obviousness assertion<sup>3</sup>, and Claim 1

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<sup>1</sup> On page 4 of the present Office Action dated 09/08/2005, in paragraph 8(a), the Examiner states “Endicott does not explicitly teach: starting a timer responsive to conclusion of a communication process using the connection; and responsive to conclusion of a predetermined time period measured by the timer, maintaining a weak reference to the connection object”.

<sup>2</sup> To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. MPEP 2143.03. *See also, In re Royka*, 490 F.2d 580 (C.C.P.A. 1974).

<sup>3</sup> In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant. *Id.*

has been erroneously rejected due to such failure to properly establish a prima facie showing of obviousness<sup>4</sup>.

This missing claimed feature is also evidenced by Howes' teaching at col. 14, lines 12-23, where Howes describes that when the standby Local Director is in an inactive state (since the active Local Director has not failed and thus this active Local Director is managing the data flow), it does not handle packets and thus its timers are not updated when connection activity occurs. When this standby Local Director becomes active (due to a failure of the active Local Director), the standby Local Director's timer field is updated to the current time such that the connection objects which the standby Local Director is now managing do not time out prematurely. These connection objects then time-out under the same circumstances as when the active Local Director is managing the connection (col. 14, lines 18-23). Importantly, the timer field is used to *time out a connection object* when no activity occurs on the connection for a specified period of time (Col. 14, lines 11-13). *Such a time out causes the object to be deleted* (col. 9, lines 22-29). It is thus urged that none of the cited references teach or otherwise suggest the claimed feature of "*responsive to conclusion of a predetermined time period* measured by the timer, *maintaining a weak reference to the connection object*" as expressly recited in Claim 1. This claimed feature advantageously allows for maintaining a weak reference to the connection object for a period of time, such that if the connection is needed during such period of time, the connection can be reused without requiring a new setup of a new connection object.

In rebuttal to the above points of error, the Examiner states that Howes teaches this missing claimed feature at Howes column 14, lines 10-12 and 24-36. Applicants urge that the only thing described by Howes that is done *responsive to conclusion* of a timer is to "time out a connection object" when no activity occurs on the connection for a specified period of time (Howes column 10, lines 10-12).

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<sup>4</sup> If the examiner fails to establish a prima facie case, the rejection is improper and will be overturned. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

## A.2. Claims 2, 3, 21 and 22

With respect to Claims 2 and 3 (and similarly for Claims 21 and 22), Appellants initially show error in the rejection of such claims for reasons given above with respect to Claim 1 (of which Claims 2 and 3 depend upon).

Further with respect to Claim 2, it is urged that none of the cited references teach or suggest the claimed feature of “determining whether a normal reference to the connection object exists; and reusing the connection if the normal reference exists”. In rejecting Claim 2, the Examiner cites Endicott’s teaching at col. 10, lines 35-47 as teaching the claimed step of reusing the connection if the normal reference exists. It should initially be noted that the Examiner cited Endicott’s teaching at Col. 5, lines 33-37 as teaching the claimed ‘connection’. The passage cited at col. 10, lines 35-47 – which is alleged to teach reusing the connection if the normal reference exists – does not describe any type of operation with respect to such ‘connection’. Rather, this cited passage states:

“Once the lock is obtained, synchronization is ensured, and thus, the referenced object for the weak reference may be updated in block 94 in the same manner as in block 91. Then, in block 96, the cycle count for the weak reference is set to the cycle count for the current collection cycle to indicate that the referenced object has been made strongly-reachable as a result of this operation. As a result, any further accesses to this weak reference during the current collection cycle will no longer require use of the locking mechanism since the referenced object is ensured of not being collected during the current collection cycle. Next, upon completion of block 96, the reference lock is released in block 98, whereby routine 88 is then complete.”

As can be seen, this passage describes a way to ensure synchronization during a (garbage) collection cycle using a lock. It has nothing to do with any type of ‘connection’ and thus does not teach or otherwise suggest the claimed step of “*reusing the connection* if the normal reference exists”. Thus, a prima facie case of obviousness has not been established with respect to Claim 2, and therefore the burden has not shifted to Appellants to rebut this obviousness assertion.

In rebuttal to the above points of error, the Examiner states that Claim 2 contains all the limitation of Claim 1 and therefore the alleged missing claimed features of Claim 2 were already addressed by the Examiner in the rejection of Claim 1. Appellants urge that the features expressly recited in Claim 2 are not included in Claim 1, and therefore the reasons given by the Examiner in rejecting Claim 1 did not address the (missing) claimed features identified above with respect to Claim 2.

### **A.3. Claims 4, 5, 23 and 24**

With respect to Claims 4 and 5 (and similarly for Claims 23 and 24), Appellants initially show error in the rejection of such claims for reasons given above with respect to Claim 1 (of which Claims 4 and 5 depend upon).

Further with respect to Claim 4 (and similarly for Claim 23, and dependent Claims 5 and 24), it is urged that none of the cited references teach or otherwise suggest the claimed feature of “determining whether a weak reference *to the connection object* exists”. In rejecting this aspect of Claim 4, the Examiner cites Endicott’s teaching at col. 2, lines 30-39; col. 7, lines 43-47; and col. 10, line 48 – col. 11, line 2 as teaching this claimed step. Appellants urge that on page 5 of the present Office Action (dated 09/08/2005), the Examiner expressly acknowledges that the cited Endicott reference does *not* teach a connection object, and it is therefore urged that since Endicott does not teach a connection object, it necessarily follows that Endicott does not teach any type of determining step with respect to such missing connection object. Thus, Endicott does not teach the specific determining step of “determining whether a weak reference *to the connection object* exists”. Therefore, a proper prima facie case of obviousness has not been established with respect to Claim 4, and accordingly the burden has not shifted to Appellants to rebut such obviousness assertion.

Still further with respect to Claim 4, none of the cited references teach or suggest the claimed feature of determining whether the connection object has been destroyed if the weak reference (to the connection object) exists. In rejecting this aspect of Claim 4, the Examiner cites Endicott’s teaching at col. 7, lines 47-52 and col. 14, lines 44-47 as teaching this claimed step. For similar reasons to those given above with respect to the first step of Claim 4, since Endicott does not teach any type of connection object, it does not teach any actions associated with such (missing) connection object, and thus does not teach the specific claimed step of determining

whether the *connection object* has been destroyed if the weak reference (to the *connection object*) exists. Therefore, a proper prima facie case of obviousness has not been established with respect to Claim 4, and accordingly the burden has not shifted to Appellants to rebut such obviousness assertion.

In rebuttal to the above points of error, the Examiner states that Appellants' argument that Endicott does not teach the missing claimed features of Claim 4 is misguided as the Examiner did not rely upon the teachings of Endicott in rejecting Claim 4, but instead relied upon the teachings of de la Salle. Applicants urge error in such assertion, as will now be shown.

The Examiner *did* in fact rely on the teachings of Endicott in rejecting the specific features recited in Claim 4. For example, in the most recent Office Action dated March 3, 2006, the Examiner states on page 5, paragraph (d):

"As per claims 4 and 23, Endicott teaches: determining whether a weak reference to the connection exists (lines 30-39 of column 2, lines 43-47 of column 7, and line 48 of column 10 through line 2 of column 11); determining whether the connection object has been destroyed if the weak reference exists (lines 47-52 of column 7 and lines 44-47 of column 14); reusing the connection if the connection object has not been destroyed (line 48 of column 10 through line 2 of column 11 and lines 33-50 of column 14)." (emphasis added by Appellants)

As can be seen, and contrary to the Examiner's rebuttal assertion, the Examiner *is* in fact relying upon the teachings of Endicott as teaching the claimed features recited in Claim 4 – and which, as shown above, are not taught by the cited Endicott reference. This Examiner reliance upon the teachings of Endicott in rejecting Claim 4 can also be seen on page 7 of the Office Action dated September 8, 2005 and page 5 of the Office Action dated March 4, 2005.

Further, the newly cited de la Salle passage (de la Salle column 8, line 62 – column 9, line 17, newly cited in the Examiner's rebuttal comments on pages 14 and 15 of the most recent Final Office Action dated March 3, 2006) similarly does not teach the features of Claim 4. Even assuming *arguendo* that the cited de la Salle reference describes a connection object, this reference does not teach or otherwise describe the particular *use* of a connection object as per the features of Claim 4. In particular, this de la Salle passage describes *creation* of a connection

object using a hash table. There is no mention or description of the particular claimed use of a connection object – specifically, there is no description or teaching of (i) determining whether a weak reference to the *connection object* exists; (ii) determining whether the *connection object* has been destroyed if the weak reference exists; or (iii) reusing the connection if the *connection object* has not been destroyed. As can be seen, Claim 4 is directed to specific actions associated with a connection object – whereas the newly cited passage of de la Salle merely describes creation of a connection object using a hash table. Thus, this newly cited de la Salle passage does not overcome the teachings deficiencies described above with respect to Endicott, and therefore a proper prima facie case of obviousness has not been established with respect to Claim 4, and therefore Claim 4 has been erroneously rejected under 35 U.S.C. § 103(a).

#### **A.4. Claims 7 and 26**

With respect to Claim 7 (and similarly for Claim 26), Appellants initially show error in the rejection of such claim for reasons given above with respect to Claim 1 (of which Claim 7 depends upon).

Further with respect to Claim 7 (and similarly for Claim 26), it is urged that none of the cited references teach or suggest the claimed feature of “sending notification to the server that the *connection object* is unreferenced when a weak reference to the *connection object* is maintained” (emphasis added by Applicant). In rejecting Claim 7, the Examiner cites Endicott’s teaching at col. 6, line 66 – col. 7, line 15 as teaching this claimed step. Appellants urge that because Endicott does not teach connection objects, it necessarily follows that it does not teach any actions associated with such (missing) connection objects. Therefore, a proper prima facie case of obviousness has not been established with respect to Claim 7, and accordingly the burden has not shifted to Appellants to rebut such obviousness assertion.

Still further with respect to Claim 7, the passage cited by the Examiner in rejecting such claim does not describe any step of *sending anything to a server*, such as a notification (as claimed), or otherwise. Thus, Claim 7 is further shown to not be obvious in view of the cited references, as there are additional claimed steps not taught or suggested by the cited references.

In rebuttal to the above points of error, the Examiner states that Appellants’ argument that Endicott does not teach the missing claimed features of Claim 7 is misguided as the Examiner did not rely upon the teachings of Endicott in rejecting Claim 7, but instead relied upon the

teachings of de la Salle (per the Examiner on page 16, paragraph 15 of the most recent Office Action, in stating “See Point (C) above”). Applicants urge error in such assertion, as will now be shown.

The Examiner *did* in fact rely on the teachings of Endicott in rejecting the specific features recited in Claim 7. For example, in the most recent Office Action dated March 3, 2006, the Examiner states on page 6, paragraph (f):

“As per claims 7 and 26, Endicott teaches: sending notification to the server that the connection object is unreferenced when a weak reference to the connection object is maintained (line 66 of column 6 through line 15 of column 7).”  
(emphasis added by Appellants)

As can be seen, and contrary to the Examiner’s rebuttal assertion, the Examiner *is* in fact relying upon the teachings of Endicott in rejecting the specific features recited in Claim 7. As described above, since Endicott does not describe any type of connection object, it necessarily follows that Endicott does not teach or otherwise such the particular usage of a connection object as defined in Claim 7, and therefore a prima facie case of obviousness has not been established with respect to Claim 7 (and thus Claim 7 has been erroneously rejected).

Still further regarding the Examiner’s rebuttal to the Appellants statements identifying error in the rejection of Claim 7 (page 16, paragraph (f)), the Examiner relies upon Endicott’s teaching at column 14, lines 33-43 as teaching the features recited in Claim 7 (see page 16, paragraph 16 of the most recent Office Action dated March 3, 2006). Specifically, the Examiner notes that Endicott describes notification to a program thread that a weak reference has *been cleared*. Even assuming arguendo that Endicott teaches such notification, this notification is not done when *a weak reference to the connection object is maintained*, as per Claim 7, but instead is done *when cleared*, and therefore does not teach, and cannot provide the resulting advantages of<sup>5</sup>,

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<sup>5</sup> Maintaining a normal reference to connection objects may be expensive from a memory usage standpoint, because it never allows unused connections to be destroyed through the RMI server garbage collection mechanism. Therefore, in accordance with a preferred embodiment of the present invention, the RMI client sets an expiration timer. When the cache timer expires, the RMI client maintains a weak reference to the connection object. If a connection to the RMI server is needed *while the connection object is weakly referenced*, the RMI server may reestablish a normal reference to the connection object and the connection *may be reused*. However, while the connection object is weakly referenced, the connection object *may also be destroyed* through the RMI server garbage

the features of Claim 7 pertaining to a specific notification pertaining to a connection object when a weak reference to such connection object *is maintained*.

**A.5. Claims 13, 14, 16, 31, 32, 34 and 39**

With respect to Claims 13, 14 and 16 (and similarly for Claims 31, 32, 34 and 39), Appellants show error in the rejection of such claims in that none of the cited references teach or suggest the claimed features of “identifying a weak reference to a connection object for a connection to a server”, “determining whether the connection object has been destroyed”, and “reusing the connection if the connection object has not been destroyed”. In rejecting Claim 13, the Examiner relies upon the reasoning given in rejecting Claim 4. Appellants urge error in such rejection, for reasons substantially the same as those given above with respect to Claim 4.

**B. GROUND OF REJECTION 2 (Claims 6, 15, 25 and 33)**

The Examiner rejected Claims 6, 15, 25 and 33 under 35 U.S.C. § 103 as being unpatentable over Endicott, Howes, and de la Salle as applied to claims 4 and 23 respectively above in view of Official Notice.

**B.1. Claims 6 and 25**

With respect to Claim 6 (and similarly for Claim 25), Appellants show error in the rejection of such claim for reasons given above with respect to Claim 1 (of which Claim 6 depends upon).

**B.2. Claims 15 and 33**

With respect to Claim 15 (and similarly for Claim 33), Appellants show error in the rejection of such claim for reasons given above with respect to Claim 13 (of which Claim 15 depends upon).



### **C. GROUND OF REJECTION 3 (Claim 8)**

The Examiner rejected Claim 8 under 35 U.S.C. § 103 as being unpatentable over Endicott, Howes, and de la Salle as applied to claim 1, in view of Wollrath et al. (U.S. 5,832,529).

#### **C.1. Claim 8**

Appellants show error in the rejection of Claim 8 for similar reasons to those given above with respect to Claim 1 (of which Claim 8 depends upon).

### **D. GROUND OF REJECTION 4 (Claims 18, 36 and 40)**

The Examiner rejected Claims 18, 36 and 40 under 35 U.S.C. § 103 as being unpatentable over Endicott, Howes, and de la Salle in view of Geise et al. (5,247,520).

#### **D.1. Claims 18, 36 and 40**

With respect to Claim 18 (and similarly for Claims 36 and 40), such claim recites that a connection object is received from a server (Specification page 12, lines 16-18), and a reference to such (received) connection object is added *to both a weak hash map and a hash map*. None of the cited references teach or otherwise such receipt of a communication object for which a reference is then added to two different hash maps – a weak hash map and a hash map.

Further with respect to Claim 18, the two hash tables described by Geise are not a hash map and a weak hash map having the particular features expressly recited in such claim - the weak hash map maintaining weak references to objects and the hash map maintaining normal references to objects. Rather, such reference merely describes use of multiple hash tables (Geise col. 5, line 64 – col. 6, line 3).

Still further with respect to Claim 18, such claim recites “responsive to conclusion of a predetermined time period measured by the timer, removing the reference to the connection object from the hash map while maintaining the reference to the connection object in the weak hash map” (emphasis added). None of the cited references teach or suggest this claimed feature, which advantageously allows for the connection, upon expiration of the timer, to either be re-used or re-claimed (Specification page 12, line 30 – page 13, line 7).

## **E. GROUND OF REJECTION 5 (Claims 19 and 37)**

The Examiner rejected Claims 19 and 37 under 35 U.S.C. § 103 as being unpatentable over Endicott, Howes, de la Salle and Geise as applied to claims 18 and 36 respectively above, further in view of Weinstein et al. (Google Groups comp.lang.java.databases).

### **E.1. Claims 19 and 37**

With respect to Claim 19 (and similarly for Claim 37), Appellants initially show error in the rejection of such claim for similar reasons to those given above with respect to Claim 18 (of which Claim 19 depends upon).

Further, it is urged that the Examiner is using improper hindsight analysis in rejecting Claim 19. It is error to reconstruct the patentee's claimed invention from the prior art by using the patentee's claims as a "blueprint". When prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight obtained from the invention itself. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 227 USPQ 543 (Fed. Cir. 1985). Due to the large number of references being used in the rejection of Claim 19 – five (5) references – it is urged that the Examiner must be using patentee's claims as a blueprint to combine such large number of references. As the Federal Circuit outlines in *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004), in making the assessment of differences between the prior art and the claimed subject matter, section 103 specifically requires consideration of the claimed invention "as a whole". Inventions typically are new combinations of existing principles or features. *Envtl. Designs, Ltd. V. Union Oil Co.*, 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that "virtuall all [inventions] are combinations of old elements"). The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. *Ruiz*, 357 F.3d at 1275. Without this important requirement, an obviousness assessment might successfully break an invention into its component parts, then find a prior art reference corresponding to each component. *Id.* This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would discount the value of combining various existing features or principles in a new way to achieve a new result – often the essence of invention. *Id.* Contrary to this reasoning, section 103 requires assessment of the invention as a whole. *Id.* This "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art

at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the prior art and combined them in the claimed manner. *Id.* In other words, section 103 requires some suggestion or motivation, before the invention itself, to make the new combination. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, Federal Circuit, No. 04-1493, June 9, 2005. In 1983, the late Judge Howard Markey made the following observation in *W.L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), which states the basic interest protected by this test—improper hindsight analysis of prior art:

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

It is thus respectfully submitted that the Examiner is using improper hindsight analysis in the rejection of Claim 19, by piecing together snippets from five (5) different references, and thus this claim has been erroneously rejected.

Still further with respect to Claim 19, Appellants show error in the rejection of such claim in that none of the cited references teach or suggest the claimed step of “determining whether the connection object has been destroyed”. In rejecting this aspect to Claim 19, the Examiner cites Endicott’s teaching at col. 7, lines 47-52 and col. 14, lines 44-47 as teaching this claimed step. As described above, since Endicott does not teach connection objects at all (and as expressly acknowledged by the Examiner in rejecting Claim 1), it is urged that Endicott cannot teach any action pertaining to such (missing) connection object, including the specifically claimed step of determining whether such (missing) connection object has been destroyed. Therefore, a proper *prima facie* case of obviousness has not been established, and the burden has not shifted to Appellants to rebut such obviousness assertion.

Similarly, because Endicott does not teach connection objects, it is urged that Endicott does not teach the claimed step of removing the reference to the (missing) connection object from the weak hash map if the (missing) connection object has been destroyed.

Still further with respect to Claim 19, it is urged that none of the cited references teach or suggest the claimed feature of “maintaining the reference to the connection object *in the weak hash map* if the connection object has not been destroyed to thereby allow use of such connection

object by a subsequent communication process between the client and server without establishing a new connection between the client and server” (emphasis added). In rejecting this aspect of Claim 19, the Examiner cites Weinstein at page 12 of 16 as teaching this claimed feature. It is urged that this passage makes no mention of any weak hash map, and thus it necessarily follows that this passage does not teach or otherwise suggest maintaining a reference to a connection object *in the weak hash map* if the connection object has not been destroyed. This further evidences that a proper prima facie showing of obviousness has not been established with respect to Claim 19.

Still further with respect to Claim 19, it is urged that the cited Weinstein reference is non-enabling. This is a print-out of various back-and-forth conversations between individuals, where one person makes an assertion and then others comment on and frequently dispute/deny such assertion (see, for example, bottom of page 11 of 16). Thus, these Weinstein assertions are not established or enabled as being true – and in fact are *merely individual opinions*.

In rebuttal to the above points of error, the Examiner states Appellants’ argument that Endicott does not teach the missing claimed features of Claim 19 is misguided as the Examiner did not rely upon the teachings of Endicott in rejecting Claim 19, but instead relied upon the teachings of de la Salle (Examiner point (C), which is used in the Claim 19 rebuttal per page 18, paragraph (20) of the most recent Office Action). Applicants urge error in such assertion, as will now be shown.

The Examiner *did* in fact rely on the teachings of Endicott in rejecting the specific features recited in Claim 19. For example, in the most recent Office Action dated March 3, 2006, the Examiner states on page 11, paragraph (9):

“As per claims 19 and 37, Endicott teaches: determining whether the *connection object* has been destroyed (lines 47-52 of column 7 and lines 44-47 and column 14); removing the reference to the *connection object* form (sic) the weak hash map if the connection object has been destroyed (lines 56-59 of column 2, lines 24-33 of column 3, and lines 33-50 of column 14)” (emphasis added by Appellants).

Still further regarding the Examiner’s rebuttal of Claim 19 points of error, and contrary to the Examiner’s assertion regarding Endicott, Applicants pointed out that the cited Weinstein

reference does not teach the features of Claim 19 (see Response to Office Action dated December 6, 2005, page 16, 3<sup>rd</sup> full paragraph<sup>6</sup>).

Still further regarding the Examiner's rebuttal of Claim 19 points of error, in response to Appellants showing that the cited Weinstein reference is non-enabling, the Examiner states that that the Weinstein reference qualifies as prior art and has been available to the public since January 1999. Appellants urge that the Examiner's assertion regarding public 'access' fails to comprehend or address the assertion that the cited art Weinstein reference is 'non-enabling'. 'Public access' and 'enablement' are very different concepts, and an assertion of one (public access) does not address or otherwise rebut the other (enablement). For example, comic strips in a newspaper are certainly accessible to the public, but generally do not provide enablement of patentable technology. As detailed above, the cited Weinstein reference – even assuming arguendo that it is publicly accessible – is non-enabling.

In conclusion, Appellants have shown numerous and substantial error in the final rejection of all pending claims in this case, and respectfully requests that the Board reverse such rejection.

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<sup>6</sup> "Still further, it is urged that none of the cited references teach or suggest the claimed feature of "maintaining the reference to the connection object in the weak hash map if the connection object has not been destroyed to thereby allow use of such connection object by a subsequent communication process between the client and server without establishing a new connection between the client and server". In rejecting this aspect of Claim 19, the Examiner cites Weinstein at page 12 of 16 as teaching this claimed feature. *It is urged that this passage* makes no mention of any weak hash map, and thus it necessarily follows that this passage does not teach or otherwise suggest maintaining a reference to a connection object in *the weak hash map* if the connection object has not been destroyed. This further evidences that a proper prima facie showing of obviousness has not been established with respect to Claim 19" (emphasis added by Appellants).

## **CLAIMS APPENDIX**

The text of the claims involved in the appeal are:

1. A method, in a client, for managing connections to a server in a distributed environment, comprising:

establishing a connection to a server;

responsive to conclusion of a communication process using the connection, starting a timer;

maintaining a normal reference to a connection object for the connection;

responsive to conclusion of a predetermined time period measured by the timer, maintaining a weak reference to the connection object; and

periodically destroying connection objects maintained by weak references.

2. The method of claim 1, further comprising:

determining whether a normal reference to the connection object exists; and

reusing the connection if the normal reference exists.

3. The method of claim 2, further comprising restarting the timer.

4. The method of claim 1, further comprising:

determining whether a weak reference to the connection object exists;

determining whether the connection object has been destroyed if the weak reference exists; and

reusing the connection if the connection object has not been destroyed.

5. The method of claim 4, further comprising restarting the timer.

6. The method of claim 4, further comprising:

establishing a new connection if the connection object has been destroyed.

7. The method of claim 1, further comprising:

sending notification to the server that the connection object is unreferenced when a weak reference to the connection object is maintained.

8. The method of claim 1, wherein the step of periodically destroying connection objects maintained by weak references comprises destroying the connection object in response to garbage collection by the server.

9. The method of claim 1, wherein the client is a client virtual machine that translates machine independent code to machine dependent code.

10. The method of claim 9, wherein the server is a server virtual machine that translates machine independent code to machine dependent code.

11. The method of claim 10, wherein the client virtual machine and the server virtual machine reside on the same host machine.
12. The method of claim 10, wherein the server virtual machine resides on a host machine that is remote from the machine on which the client virtual machine resides.
13. A method, in a client, for reusing a connection to a server, comprising:
  - identifying a weak reference to a connection object for a connection to a server;
  - determining whether the connection object has been destroyed; and
  - reusing the connection if the connection object has not been destroyed.
14. The method of claim 13, further comprising:
  - responsive to garbage collection by the server, destroying the connection object.
15. The method of claim 13, further comprising:
  - establishing a new connection if the connection object has been destroyed.
16. The method of claim 13, wherein the connection object is a remote method invocation object.
18. A method, in a client, for caching connections to a server, comprising:
  - receiving a connection object for a connection from a server;



adding a reference to the received connection object to a weak hash map and a hash map, wherein the weak hash map maintains weak references to objects and the hash map maintains normal references to objects;

responsive to conclusion of a communication process using the connection, starting a timer; and

responsive to conclusion of a predetermined time period measured by the timer, removing the reference to the connection object from the hash map while maintaining the reference to the connection object in the weak hash map.

19. The method of claim 18, wherein the connection is between the client and the server, and the connection object is used to enable the connection between the client and server, further comprising:

determining whether the connection object has been destroyed; and

removing the reference to the connection object from the weak hash map if the connection object has been destroyed; and

maintaining the reference to the connection object in the weak hash map if the connection object has not been destroyed to thereby allow use of such connection object by a subsequent communication process between the client and server without establishing a new connection between the client and server.

20. An apparatus, in a client, for managing connections to a server in a distributed environment, comprising:

connection means for establishing a connection to a server;

timer means for starting a timer responsive to conclusion of a communication process using the connection;

normal reference means for maintaining a normal reference to a connection object for the connection;

weak reference means for maintaining a weak reference to the connection object responsive to conclusion of a predetermined time period measured by the timer; and

garbage collection means for periodically destroying connection objects maintained by weak references.

21. The apparatus of claim 20, further comprising:

means for determining whether a normal reference to the connection object exists; and

means for reusing the connection if the normal reference exists.

22. The apparatus of claim 21, further comprising means for restarting the timer.

23. The apparatus of claim 20, further comprising:

means for determining whether a weak reference to the connection object exists;

means for determining whether the connection object has been destroyed if the weak reference exists; and

means for reusing the connection if the connection object has not been destroyed.

24. The apparatus of claim 23, further comprising means for restarting the timer.

25. The apparatus of claim 23, further comprising:  
means for establishing a new connection if the connection object has been destroyed.
26. The apparatus of claim 20, further comprising:  
means for sending notification to the server that the connection object is unreferenced  
when a weak reference to the connection object is maintained.
27. The apparatus of claim 20, wherein the client is a client virtual machine that translates  
machine independent code to machine dependent code.
28. The apparatus of claim 27, wherein the server is a server virtual machine that translates  
machine independent code to machine dependent code.
29. The apparatus of claim 28, wherein the client virtual machine and the server virtual  
machine reside on the same host machine.
30. The apparatus of claim 28, wherein the server virtual machine resides on a host machine  
that is remote from the machine on which the client virtual machine resides.
31. An apparatus, in a client, for reusing a connection to a server, comprising:  
identification means for identifying a weak reference to a connection object for a  
connection to a server;  
determination means for determining whether the connection object has been destroyed;  
and

connection means for reusing the connection if the connection object has not been destroyed.

32. The apparatus of claim 31, further comprising:

garbage collection means for destroying the connection object responsive to garbage collection by the server.

33. The apparatus of claim 31, further comprising:

means for establishing a new connection if the connection object has been destroyed.

34. The method of claim 31, wherein the connection object is a remote method invocation object.

36. An apparatus, in a client, for caching connections to a server, comprising:

receiving means for receiving a connection object for a connection from a server;

reference means for adding a reference to the connection object to a weak hash map and to a hash map, wherein the weak hash map maintains weak references to objects and the hash map maintains normal references to objects;

timer means for starting a timer responsive to conclusion of a communication process using the connection; and

removal means for removing the reference to the connection object from the hash map responsive to conclusion of a predetermined time period measured by the timer while maintaining the reference to the connection object in the weak hash map.

37. The apparatus of claim 36, wherein the connection is between the client and the server, and the connection object is used to enable the connection between the client and server, further comprising:

means for determining whether the connection object has been destroyed; and

means for removing the reference to the connection object from the weak hash map if the connection object has been destroyed; and

means for maintaining the reference to the connection object in the weak hash map if the connection object has not been destroyed to thereby allow use of such connection object by a subsequent communication process between the client and server without establishing a new connection between the client and server.

38. A computer program product, in a computer readable medium, for managing connections in a distributed environment, comprising:

instructions for establishing a connection;

instructions for starting a timer responsive to conclusion of a communication process using the connection;

instructions for maintaining a normal reference to a connection object for the connection;

instructions for maintaining a weak reference to the connection object responsive to conclusion of a predetermined time period measured by the timer; and

instructions for periodically destroying connection objects maintained by weak references.

39. A computer program product, in a computer readable medium, for reusing a connection to a server, comprising:

instructions for identifying a weak reference to a connection object for a connection;  
instructions for determining whether the connection object has been destroyed; and  
instructions for reusing the connection if the connection object has not been destroyed.

40. A computer program product, in a computer readable medium, for caching connections to a server, comprising:

instructions for receiving a connection object for a connection from a server;  
instructions for adding a reference to the connection object to a weak hash map and a hash map, wherein the weak hash map maintains weak references to objects and the hash map maintains normal references to objects;  
instructions for starting a timer responsive to conclusion of a communication process using the connection; and  
instructions for removing the reference to the connection object from the hash map responsive to conclusion of a predetermined time period measured by the timer while maintaining the reference to the connection object in the weak hash map.

## **EVIDENCE APPENDIX**

There is no evidence to be presented.

## **RELATED PROCEEDINGS APPENDIX**

There are no related proceedings.